point no more severe criticism is possible than the statement that room for improvement exists.

"(4) The restriction of outlook has impaired promptitude in the issue of reports. Many statistics lose a large part of their value after a comparatively short lapse of time. Especially is this true in a rapidly growing country like Canada.

"(5) Lack of unity and coördination prevents true comparisons between Canada and other countries. The recent growth of international trade and intercourse has rendered such comparisons more than ever necessary, and they have become indispensable to the national progress of Canada."

In concluding this notice of an exceedingly interesting report attention may be directed to the schematic diagram which forms its frontispiece. This diagram is offered as a suggestion of the extent of the field to be covered by an adequate system of Canadian statistics, the several divisions being so grouped as to indicate their reciprocal relation.

F. S. CRUM.

REPORT OF THE MASSACHUSETTS COMMISSION ON COMPENSATION FOR INDUSTRIAL ACCIDENTS, JULY 1, 1912.

The final report of the Massachusetts Commission on Industrial Accidents maintains the usual high quality of official reports in that state. This commission was constituted in June, 1910, to investigate the effects of the existing laws of Massachusetts, and of other jurisdictions, relating to employers' liability; to confer with the similar commissions of other states; to draft a new compensation act; and to compile statistics. It was soon found that the commission would have to collect its own data. No bureau or office had statistics showing, in cases of fatal accidents, the extent to which others were dependent upon the deceased for support; nor showing, in cases of non-fatal accidents, whether the injuries resulted in complete or partial disability, and the duration of the disability. The commission accordingly induced 120 employers to report all accidents occuring during ten weeks. The brief period covered, the small number of establishments reporting, the resulting small number of accidents reported, and the short interval between the accidents and the printing of the statistics,—all limited the trustworthiness of any conclusions which might have been drawn from these figures. The commission, therefore, rightly regarded this inquiry as experimental only. It was seen that industries should be differently classified; that the figures should comprehend all establishments in the state; and that they should cover a longer period. The commission filed its first report in January, 1911.*

In May of the same year it submitted drafts of three bills, one providing for voluntary mutual insurance of employees by employers, and denying the three common law defenses of contributory negligence, fault of fellow servant, and assumption of risk to those employers not adopting the act; an-

* Appendix B of the final report reprints some of the tables of the first report.

other providing for compulsory compensation by employers; and the third for compulsory compensation supported by contributions of employees as well as employers. Few states have ventured to adopt a "compulsory" scheme* since the disheartening decision by the New York Court of Appeals in Ives *v.* South Buffalo Railway Co., although it is the general belief that there are few supreme courts that would have decided the same case in the same way. Massachusetts could almost surely have enacted a compulsory law without danger of its overthrow by the Court,† but chose the indirect, and probably temporary, New Jersey-Wisconsin expedient of making the law nominally voluntary, but very burdensome to non-assenting employers. The Massachusetts law has, however, many unique features which must be noted here because the chief work of the commission, since its preliminary report, has consisted in estimating the cost of compensation under the new law, enacted July, 1911, to become effective July, 1912. Assenting employers must insure in the Massachusetts Employees Insurance Association (a mutual society on the German plan), or in a regular insurance company. Employers not assenting are deprived of all effective defenses in damage suits. An Industrial Accident Board of five members administers the act. Benefits are provided for dependents of victims of fatal accidents, graded according to the wages of the deceased and the degree of dependency; like benefits for a longer period in the cases of total disability; and benefits graded according to loss of earning capacity in cases of partial disability with additional specific benefits for certain specified injuries. It is deserving of note, in passing, that the insurance rates under the Massachusetts compensation law are comparatively low. While this fact is partly due to the absence of some specially hazardous industries in Massachusetts, it is due to no small extent to the precautions taken in drawing the law, including a waiting time of two weeks during which the injured employee can claim only medical and hospital care; the specific compensation provided for specific injuries, thereby avoiding expensive litigation to determine the degree of injury; and the arrangement that the employer, not the employee, should furnish medical care, thereby avoiding a considerable amount of malingering and collusion.

Before its enactment, the measure received the approval of the Supreme Judicial Court.‡ The opinion affirms the constitutionality not only of the modification of the rules of law but also of a provision exempting employers of domestic servants and of farm laborers. The latter was undoubtedly important to the success of the bill in the legislature. Nearly all the state legislatures which have recently enacted compensation laws have exempted employers of farm laborers in one way or another, thereby testifying to their recognition of the fact that farmers as a class have not yet taken an unselfish view of their responsibilities as employers. In the case of Massa-

* The report here under review contains the text and a summary of each state compensation law, and summaries of the laws of other countries. Thus this report incidentally furnishes the most convenient summary available of recent compensation legislation.

† See brief by one of the members of the commission, reprinted in the final report, pp. 95 ff.

‡ The opinion is reproduced in Appendix C of the commission's report.

chusetts "it was thought by a majority of the commission that the conditions of domestic service and agriculture in Massachusetts did not require a change in the law." The commission did not undertake to collect accident statistics relative to farm labor, but unless conditions in Massachusetts are very unusual the view of the majority was overly optimistic. However, Massachusetts, along with her sister states, may be pardoned for yielding to political expediency in discriminating against certain of her laborers, if only the discrimination is removed when that becomes possible.

By successive resolves of the legislature authority was secured which enabled the commission to collect statistics for a period of fourteen months, every employer being required to report all accidents on blanks furnished by the commission. The report form for non-fatal accidents calls for name and location of employer, total (average) number of employees in Massachusetts, nature of business; name, sex, and age of the injured employee, home address, average weekly wages, occupation when injured, name of tool or machine by which injured; date and hour of accident, date of beginning of absence, if later than accident, nature of injury, probable period of disability, and description of accident. The supplementary report calls for date of return to work, dates of beginning lower-value work and of full-value work on the basis of wages at the time of the accident, probable duration of disability if injured employee has not returned after sixty days; and permanent result of the accident. The report for fatal accidents omits some of the specifications of the non-fatal report, and adds marital condition, number of children under eighteen, other dependents, and the extent of dependency.

The commission did not attempt to tabulate more than a small part of the data collected, but gave its data to the permanent Accident Board which will be able to make more liberal use of the material than the temporary commission conceived that it had any warrant for doing. For instance, though data were gathered as to causes, ages, and nature of injury—matters of the utmost significance in accident prevention—the commission did not report upon them, as it was not commissioned to consider the important subject of prevention.

The tables presented in the present report were prepared chiefly for the purpose of calculating the cost of compensation under the law that was about to be administered by the Accident Board. The commission has taken the utmost pains to emphasize the extreme caution with which its figures should be accepted. We are warned that they "will not serve as a safe guide for making rates in insuring individual employers," and, even in the attempt to ascertain costs by industries, we are repeatedly reminded of the short period of the investigation, of the as yet incomplete reporting of accidents, and of the constant necessity of resorting to averages and estimates (not guesses). All of these limitations will, of course, be gradually overcome as the collection of accident statistics continues.

The German classification of industries was finally adopted not only because of its technical merit, but because its adoption would facilitate comparisons with the longest and best series of accident statistics in the

world. Fortunately, it was not difficult to compare this classification with those of the Massachusetts Bureau of Statistics and the United States Census.

The tables show that only 13.71 per cent. of the manufacturing establishments of the state reported accidents during the twelve months ending April 30, 1912, but the reporting concerns apparently employed over 80 per cent. of those engaged in the industries included in the reports. During the first two months of the statistical year there was no penalty for failure to report, and no penalty was actually enforced in the remaining months. The reporting may, therefore, be regarded as reasonably satisfactory. The commission believes that a large proportion of the non-reporting establishments really had no accidents, and it is evident that imperfect reporting is one of the least serious of the problems confronting the new Accident Board. Indeed, it is suggested that many trivial accidents are being reported which may be excluded through more careful instructions to employers.

In attempting to estimate the cost of compensation under the new law, the commission prepared tables aimed to disclose the cost of medical and hospital service, of compensation in the cases of fatal accidents, of compensation for specified injuries, and of that for disability. The commission points out some of the grounds for postponing any conclusions which might appear to follow from the tables: For example, frequently employers could furnish no information as to dependents left in the case of fatal accidents, especially in the building trades, in engineering and excavation works, and other industries with shifting labor forces; and in nearly 4 per cent. of the non-fatal cases, the duration of the disability could not be determined.

In the final table the estimated costs of all sorts of compensation are compared, industry by industry, with the estimated pay-roll in each industry, to obtain the "net" cost per $100 of pay-roll. (Net cost here excludes provision for prevention of accidents as well as provision for expenses.) No rates were computed for industrial groups embracing less than 10,000 employees. In this table the highest costs are found in the building and transportation groups—the net cost per $100 of pay-roll in the building trades (which are not subdivided) being $1.65; among steam railway employees (not subdivided), $1.37; among teamsters, $1.09; and street railway employees, $1.00. Markedly lower are the rates in the most hazardous manufacturing industries—woodworking, $0.76; paper manufacturing, $0.67; gas and water works, $0.65; and iron and steel manufacturing only $0.58. The lowest rates, among the industries important enough to justify an estimate, are found in boot and shoe manufacturing, $0.14; and in printing and publishing, $0.12.

Whether or not these estimated rates prove to be anywhere near the true costs only time and experience can tell. The commission clearly had its own misgivings, and apparently some if its members questioned the wisdom of venturing upon so uncertain ground, but "a majority of the commission believes that it is justified in presenting the data that it obtained in the course of its investigations, even though fuller information derived from

experience under the new law may hereafter disclose defects not now apparent." The figures tending to show cost, though most carefully prepared, and elaborately presented, are only provisionally useful; the real service of the commission, in this as in other respects, has been to prepare the way for the continuous work of the Accident Board. This is in fact the commission's own view of its mission,—a mission which it has most faithfully performed.

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Scientific American Reference Book, 1913. Edited by Albert A. Hopkins and A. Russell Bond, Munn & Co., New York. Pp. 597. This book, which is somewhat larger and of more permanent value than the ordinary statistical almanac or year book, and rather less complete than a cyclopedia, consists of two distinct parts: I, "Statistical Information," and II, "Scientific Information." The former is that portion of the work which is of chief interest to statisticians. It is divided into sixteen chapters and occupies four hundred and fifty-six pages, crowded with tabulations and graphic representations of the latest data as well as those for a considerable period of time.

The chief topics which constitute chapter headings are as follows: "Population and Social Statistics; Farms, Foods, and Forests; Mines and Quarries; Manufactures; Commerce; Mercantile Marine; Railroads; The Panama Canal; Telegraphs and Cables; Wireless Telegraphy; Telephone Statistics of the World; Post Office Affairs; Patents, Trade Marks, and Copyrights; Armies of the World; Navies of the World; Aviation." These brief headings are inadequate to represent the vast amount and variety of information contained in the book, but a full index at the end of the volume, containing some seventeen hundred items, indicates the scope of the work and renders its use a matter of ease.

The data contained in the book are drawn from reliable official sources, and the editors have utilized the services of a large number of government officials and professional statisticians of established reputation in the preparation of the matter for publication.

Little has been attempted by the editors in the way of textual analysis or explanation. The tables are well constructed and the typography is excellent. In a few cases, however, in order to economize space, some of the charts and diagrams have been reduced to such small scale as to render the legends illegible. One may also feel inclined to criticize the very generous use of graphic devices of a popular, rather than a scientific character, to represent magnitudes not easily comprehended in the abstract, such as gigantic gas tanks, baskets, barrels, engines, etc.

On the whole, the book will be a useful aid to those who have neither the time nor the opportunity to consult the original sources of information.

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